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PRODUCTION OF GRANULATED FERTILIZERS IN CZECHOSLOVAKIA

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Increased agricultural production depends, in part, on fertilizers which are either combined with other types of fertilizers or concentrated into larger particles, or granules. Mixed, combination fertilizers can be employed economically only where all the conditions for the best utilization of all the fertilizer elements are present. On the other hand, simple fertilizers, which include granulated superphosphates, can be used anywhere in effective doses. Granulated phosphates have many advantages over powdered fertilizers, the most important being that phosphoric acid can maintain its water solubility for a long period of time. Granulated superphosphates can be scattered together with grain and can nourish it over a long period. On the other hand, powdered superphosphates have to be sprayed over a wide area and tend to feed weeds, which then grow faster than the originally fertilized crop.

In 1952, following extensive tests and study, the "Lucebni zavody" [chemicals] Plant in Prerov began production of granulated superphosphate fertilizer with newly developed equipment.

Many difficulties were encountered at first. Machines were originally set up to handle African phosphates, and fresh, powdered superphosphate was granulated immediately after coming off the continuous production equipment. However, every minor breakdown led to a stoppage of powdered superphosphate production and also halted production of granulated superphosphates. At first, there were many breakdowns. The quality of the final product was not as good as it should have been, primarily because the granules contained a large volume of free phosphoric acid [sic]. Other difficulties also had to be overcome in order to maintain a sufficient supply of granulated superphosphates.

Today, the following process is used in the production of granulated superphosphates: Powdered superphosphate is left to ripen, in storage, for 6 weeks. It is then moved by conveyor belt to a mixer for blending with what is called a "fine part" (Jemny podil), which is a waste product in the production of granules on the vibrator screens. From the mixer, the material passes into a rotating drum or granulator, where the powder is dampened with water. The rotation of the granulator drum produces various sizes of granules, depending on the quantity of water added, the manner in which it is introduced into the powder, the composition of the superphosphate, and the ratio of "fine parts" to powdered superphosphate. The resulting granules are dried by hot air in a rotary drying drum, and, in the process, are heated to between 70 and 100 degrees centigrade. They are then moved, via bucket-type elevator (kapsovy vytah) to a rotary cooler, with a design similar to that of the drier. From this stage, the granules pass through a sorting device which divides them according to size. Granules larger than 5 millimeters are crushed once more and reprocessed; the remainder are stored for future shipment to consumers.

The new method of production was instrumental in increasing the production of granulated fertilizers. Thus, the production plan for granulated superphosphate was raised 24.7 percent and the quality of the product was improved. New technological processes also improved working conditions. Before the new method was introduced, workers were forced to wear gas masks and had to be relieved several times during one shift because of the dangerous concentration of gases in the air, resulting from the use of hot, unripened superphosphate with a high volume of free phosphoric acid.

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However, even now it is impossible to eliminate completely all gases in the air and the excessive heat originating from the driers.

During the first half of 1955, the plant fulfilled its plans as follows (in percent): plan for gross value of production, 104; plan for the production of goods, 102.7; plan for assortment of products, 99.1; plan for specific tasks, 101.1; production plan for phosphorous fertilizers, 100; and the labor productivity plan per worker, 104.1. The value of accumulation (akumulace) was exceeded by 84.5 percent. However, the most important achievement is the fact that the plan is being fulfilled while production costs are running at only 98.6 percent of the planned expenses.

The "Lucebni zavody" Plant tests its products in special laboratories. The "Lucebni zavody" Plant is also in close touch with the sugar refinery in Prosenice, which is testing the effect of granulate superphosphates on sugar beet crops. Close cooperation is also maintained with research and cultivation institutes in Topolnicky in Slovakia, in Ruzyn, Brno, Kralice na Hanze, the state farm in Prerov, and the JZD in Sisma.

At the end of 1954, a conference was called to discuss production and utilization of granulated superphosphates. At this time, suggestions were submitted calling for the division of superphosphate granules into two classes: 1-2 millimeters, and 2-5 millimeters.

In December 1955, another conference of research workers, agricultural workers, and workers from the fertilizer plant will be convened. This time, the conference will evaluate successes made over the past year and will discuss further improvements and better aid to agriculture, as outlined for the "Lucebni zavody" Enterprise in the directives issued by the Tenth Congress of the KSC in June 1954.

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